Norms, structures, procedures and variety in risk-based governance: the case of flood management in Germany and England[1]

Kristian Krieger[2]

Abstract: Risk-based governance is argued by many to hold out the promise of a more rational and efficient state, by making explicit the limitations of state interventions and focusing the finite resources on those targets where the probable damage is greatest. This paper, however, challenges the assumption that risk-based governance has the potential for universal and uniform application across developed countries by comparing contemporary flood management in Germany and England. On first inspection, flooding appears to be a paradigmatic case of 'risk' colonising European policy discourses with traditional 'flood defence' giving way to 'flood risk management' in the context of climate change, political and cost pressures on flood protection in the wake of recent disasters, and European-wide flood maps that publicly identify properties at risk. Drawing on in-depth empirical research, however, this paper shows how the role, influence, and even definition of 'risk' is institutionally shaped within the institutional environments of the German and English flood management. In particular, the use and conceptualisations of risk in governance are variously promoted, filtered or constrained by the administrative structures, norms, and political and cultural expectations that are embedded within the flood management and the wider polities of each country.

This paper examines the following questions: Is risk-based governance the same everywhere? If not, how does it vary? How can the variation be explained? The paper therefore critically engages with the scholarly debate about the dynamic rise of risk-based governance. Risk-based governance implies that governance resources (e.g. financial, regulatory, informational measures, price/economic incentives) are allocated on the basis of calculations of risk (Rothstein et al., 2006b). Calculating risk normally means quantitatively assessing the probability of certain outcomes, for instance the potential economic losses from disasters.

Increasingly, scholars have been making arguments about the 'attractions of risk-based regulation' (Hutter, 2005); the 'risk colonisation' of an increasing number of policy domains (Rothstein et al., 2006a); the rise of 'risk management of everything' (Power, 2004) and the pervasiveness of risk-based routines and practices of government in most areas of life (O'Malley, 2004). This scholarly literature echoes the wide endorsement of risk by policy-makers: The European Commission calls risk a 'crucial' component of public policy (EC, 2002) while the OECD reports favourably on the progress made by some of its member states towards adopting risk-based governance (OECD, 2009). In these public and scholarly debates, the underlying drivers of this adoption are of two kinds, namely that risk-based governance ensures a more efficient use of finite resources, as well as more accountable governance. In times of austerity and good governance, arguments about the universal rise of risk-based governance therefore seem to make good sense.

Similar arguments can be made for the empirical case study of this paper, the management of flooding. Flood management has attracted substantial attention by policy-makers in European countries in recent years because of the dramatic increase in the number of floods causing significant economic damage since the 1990s[3] (Barredo, 2007), including such disasters as

[1] This draft paper will be presented at the 4th Biennial Conference of the ECPR Standing Group on Regulation & Governance at the University of Exeter, 27-29 June 2012. Please note that the title of the paper has been changed to the one in the Conference Programme. I would like to thank Henry Rothstein, David Demeritt and Sotiria Theodoropoulou for their useful comments. Please do not quote without permission by the author.

[2] Department of War Studies, King's College London, Email: kristian.1.krieger@kcl.ac.uk.

[3] The average number of 'major floods' per year between 1990 and 2005 increased by 241% on the years between 1950 and 1989 (Barredo, 2007). Barredo defines 'major floods' as events with casualties of more than

the Elbe/Danube flood in 2002 (about eleven billion USD of economic damage) and the summer 2007 floods in England (about four billion USD of economic damage).

In response to these disasters, flood management has undergone a paradigmatic shift across Europe from flood defence to flood risk management in the 1990s and 2000s (Mitchell, 2003, Johnson et al., 2005, Krieger, 2012). The use of engineered flood defences (e.g. embankments; dykes) has increasingly been viewed as counterproductive: Flood defences fail to provide safety, have adverse effects on natural retention space for water, create a false public sense of security behind defences and are costly to build. Instead, an approach emerged across Europe in the 1990s and 2000s that introduced a wider range of flood management measures (land-use management/planning; flood insurance; flood risk communication; environmental policies such as preserving wetlands). These measures aim at 'making space for water/rivers', recognising the difficulty to fully control flooding and the shortcomings of flood defences.

The concept and instruments of risk form an important element in many of these initiatives and policy reforms. Most notably, the EU Flood Directive (EC, 2007) treats risk assessments as important instruments to achieve the efficient use of resources and to make explicit the boundaries of flood management. Concretely, risk assessments provide a "valuable basis for priority setting and further technical, financial and political decisions regarding flood risk management" (paragraph (12)). In terms of transparent goal-setting, the Flood Directive requires member states to produce flood risk maps and risk management plans and make them publicly accessible.

Flood management in the two country cases, Germany and England[4], in general mirrors this paradigm shift. Germany and England have reviewed their approaches to flood management since the mid- and late-1990s respectively, following floods at the Rhine river (1993 and 1995) and across England and Wales in Easter 1998. The reforms in the two countries adopted the label 'making space for water' (DEFRA, 2005) and 'room for rivers' (Bundesregierung, 2005a). As the concepts of 'room' and 'space' suggest, land-use regulation has become a central part of the emerging flood management approaches (LAWA, 1995, LAWA, 2004, DCLG, 2006b, DETR, 2001). Other domains beyond flood defences, such as commercial insurance for private risk management (LAWA, 2004, ABI, 2001, ABI and Government, 2008) and flood risk communication (UBA, 2006, ABI, 2004b, EA, 2009), have also received additional attention in the emerging flood management approaches.

Flood managers in Germany and England also stress the central role risk assessments play in the reorganisation of flood management. The UK Environment Ministry DEFRA promises that "risk evidence base will drive our risk management activities" (2005, 19) while Germany's key flood management guidance acknowledges that risk assessment instruments and improved knowledge about the threats are essential for a targeted, forward-looking flood management (LAWA, 2004).

At first glance, the development in the field of flood management therefore tells a story of the rise of uniform risk-based governance in areas in which resources are scarce and performance of governance has fallen short of public (safety) expectations. A closer look at flood management in Germany and England, however, raises questions as to the universality and

70 people and/or the direct damage is larger than 0.005% of the EU GDP in the year of the disaster. In relation to 2011 EU GDP, that would mean damage greater that 630 million EUR.

[4] This paper focuses on the flood management of England. Since devolution in 1999, Scotland and Northern Ireland have increasingly differentiated approaches of their own. This concentration on England where the central government in Whitehall plays an increasingly important role for flood management, however, makes sense because England's institutional set-ups most strongly contrasts with Germany's.

uniformity of risk-based governance: For instance, why does England's central government strongly rely on a risk-based benefit-cost ratio to allocate its flood defence budget while Germany's Federal government allocates most of its spending in accordance to the '*Koenigsberger Schluessel*' (an allocation key proportional to the population numbers of Germany's 16 states)? Why do England's national planning policies cover areas exposed to flood events as rarely as once every 1,000 years with relatively flexible regulations based on three risk zones while Germany's government regulates very restrictively and almost exclusively new property developments in areas that are inundated on average once every 100 years? These questions point to a diversity in risk-based flood management that seems rather puzzling in view of the arguments in support of international convergence in flood management regimes.

As this paper will empirically demonstrate, the conceptualisation and use of risk in governance can display significant variation between countries. The argument of this paper is that risk-based governance is shaped by a set of country-specific institutional variables. Specifically, administrative and state structures, procedures, norms, as well as political and cultural expectations promote, filter or constrain the adoption of risk-based governance.

This paper is organised as follows: Section 1 briefly discusses arguments about the universal appeal and drivers of risk-based governance – and contrasts these with neo-institutionalist arguments that explain cross-country variance in regulation and governance. Section 2 produces, first, a snapshot of flood management in Germany and England and the role of risk therein. Second, the section identifies three sets of institutional variables and demonstrates how they result in substantial variation in the use of risk in flood management. The concluding section 3 relates the empirical findings to the arguments from section 1 and sketches out a prospective research agenda beyond the issue area of flooding and the country cases of Germany and England.

1 RISK-BASED GOVERNANCE EVERYWHERE?

Risk is conventionally defined as the probability of adverse consequences. This definition includes three core aspects: quantification and science-based assessments ('objectively' calculating risk); 'monetarisation' of adverse consequences (expressing probable damage in currency units as comparable and widely comprehensible terms); and the use of probability theory to reduce uncertainty as much as possible (assessing the probability of damage occurring).

These aspects of risk resonate with two debates in the governance field about managing risk. The first debate is concerned with an economic efficiency orientation in state activities, as well as the role of the state in society and economy. This debate is often associated with (critical accounts of) neoliberalism. Arguments associated with neoliberalism challenge the inefficient post-war state and promote market-based and economic efficiency-oriented governance (Peck and Tickell, 2002, Castree, 2008a, Castree, 2008b). Specifically, from a neoliberal perspective, risk-based governance can be understood as a means to address problems of overregulation (Hutter, 2005, Black, 2005), diffuse an economic logic across an ever increasing number of areas of government and society (O'Malley, 1999, O'Malley, 2004), and introduce non-state solutions to risk management challenges (Ericson et al., 2003, O'Malley, 2003).

Quantification and monetarisation enable an economic evaluation of state interventions via cost-benefit analysis and economic impact assessment. At the same time, quantifying and 'monetarising' probable damage can be understood as a prerequisite for the mobilisation of insurance markets (SwissRe, 2002, Priest, 1996). Furthermore, informing individuals of their

exposure to threats on the basis of intelligible risk terms enables and 'responsibilises' individuals to manage their own risks (Ericson et al., 2003).

The second debate is about accountability pressures on state actors. Accountability pressures require actors to explain and justify their decisions and performance vis-a-vis other parties. Traditional mechanisms of accountability (such as Parliament, courts and auditors) are complemented and reinforced by other developments: One side of this is societal (e.g. the less deferential citizens of late modernity (Giddens, 1991)) and technological change (e.g. Internet access) that increases public scrutiny of state interventions. The other side includes legal (e.g. freedom of information legislation) and regulatory changes (e.g. the rise of 'regulation inside government' (Hood et al., 1999, Light, 1993)).

The increased public scrutiny and accountability pressures have two implications. First, actors have increased reporting obligations and are subject to auditing. Risk instruments quantify, standardise and monetarise the potential harmful consequence. This allows for the measurement of the status quo, effectiveness of interventions and the quantitative definition of the objectives of state activities, facilitating the assessment of state activities by the public and other 'auditors'. Second, public scrutiny and accountability pressures on state actors intensify blame attribution games and increase actors' blame deflection efforts. Blame games occur as a consequence of governance failures (especially those concerning health and safety risks (Hood, 2002, Rothstein et al., 2006a)) which can be argued to be inevitable in view of the 'bounded rationality' in decision-making (Simon, 1957). Risk-based governance may serve defensive purposes by contributing to the blame deflection capacities of actors. This is, first, because risk-based governance assigns special credibility and legitimacy to its users and their risk-based interventions because of its quantitative and science-based, thus 'objective' character (Porter, 1995, Miller and Rose, 1990). Second, if actors use risk instruments as an informational basis, the fact that risk only provides the odds (and not certainty) offers a justification should anything go wrong (Luhmann, 1993, Rothstein et al., 2006a).

Both neoliberalisation and rising accountability pressures have been presented as universal trends, underpinned by the wide range of cross-country and cross-sector neoliberalisation case studies (Castree, 2008a) and cross-country political commitment to accountability and good governance (EC, 2001). In relation to risk-based governance, this would imply that the particular form of risk-based governance (revolving around quantification, scientific foundations, monetarisation/calculations of economic damage, and the presence of (tamed) uncertainty) can also be expected to be a universal phenomenon.

However, there are reasons to question this universality in the adoption of this particular form of risk-based governance. First, scholars have questioned the universality of neoliberalisation and accountability pressures. On the former, Castree (2008b), for instance, advises that substantive commonalities of 'neoliberalisation' cases may sometimes be so limited that 'neoliberalisation' in a particular case only exists conceptually but not in actuality. On the latter, Hood and Scott (2000), in their analysis of regulation inside government, highlight the lack of systematic, cross-national surveys of regulation. Second, literature in the closely related fields of environmental governance and the politics of regulation highlight cross-national variation in state regulations (Jasanoff, 1986, Knill and Lenschow, 1998, Lees, 2007, Lodge et al., 2008, Schrader-Frechette, 1991, Vogel, 1986, Vogel, 2003) which are frequently explained with reference to institutional variables. Institutional variables include the separation of powers between executive and legislative and low barriers to litigation (Vogel, 1983); standard operating procedures in public administration and fragmentation of the state (Lees, 2007); prevailing world views according to cultural theory (Lodge et al., 2008); and political culture (Jasanoff, 1986, 2005). These examples normally show how institutionalised

policy ideas, structures and approaches prevail vis-a-vis or shape emerging ideas such as risk-based governance due to the 'path dependency' of policy-making and organisational change (Krasner, 1983, North, 1990, Pierson, 2000) or the 'logic of appropriateness' and institutional fit with existing arrangements (Knill, 1999, March and Olsen, 1984).

Is there a cross-country convergence towards uniform risk-based governance? Or can we identify institutionally determined variance in the uses of risk in governance? In response to these questions, the following sections develop and apply a cross-country comparative analysis of flood management in Germany and England in order to explore the effects of institutional variables on the use of risk in governance.

2 RISK IN FLOOD MANAGEMENT OF GERMANY AND ENGLAND

This section first provides a brief description of the role of risk in two key policy domains of flood management in Germany and England, followed by a discussion of three sets of institutional variables that explain cross-country variation in risk-based flood management. Description and explanation are informed by an extensive analysis of key policy documents, as well as 48 interviews with key decision-makers and stakeholders in the flood management of Germany and England held between April 2008 and January 2010. Data was collected from representatives of water, environment, planning authorities at different levels of government, as well as stakeholders (including insurers, interest groups such as environmental NGOs, farmers, and property developers).

2.1 Snapshot of flood management of Germany and England

This section provides a snapshot of flood defence management and land-use regulation within Germany's and England's flood management. It describes the regulatory core of the two policy domains (along with their use of financial and informational resources to implement the regulations), as they have emerged between the 1990s and 2007/8[5].

Flood defences have historically been at the heart of public flood management but face, as noted, a number of challenges due to their behavioural, environmental and financial consequences. Land-use regulation, primarily restrictions on the use of areas at risk of inundation, has emerged as a key response to flooding in the emerging approaches because it addresses the problem of asset accumulation in areas at risk, does not require public revenue and has beneficial environmental effects. However, it negatively affects economic activities in areas at risk. Given cost pressures and the threat of overregulation, risk-based approaches in the two domains appear as appealing policy options. Risk features in each of the two domains across both countries but in distinctive ways and to varying degrees.

Flood defence management

How does risk-based flood defence management look like in the two countries? Three distinctions can be identified.

The first distinction concerns the distinctive types of policy objectives set for flood defence management. Germany's state aims at providing similar levels of safety to its population through the HQ standards, in particular HQ100. HQ100 (with HQ being the acronym for water level) implies in flood defence management that properties are to be protected against an event that statistically occurs once or more in 100 years. If an event is less frequent, say one in 150 years (HQ150), individuals need to expect to be inundated. While HQ100 is not the only HQ-standard and is not in all German states formally defined as minimal safety

[5] The cut-off date corresponds to the adoption of the EU Floods Directive when preparations for the gradual introduction of the risk-based elements of the EU Floods Directive began to introduce a new dynamism into risk-based flood management.

standard, its central role in flood management manifests itself in a number of ways – for instance, as objective for the flood management plans developed by the states as required under the Federal Flood Protection Act from 2005 (Berendes, 2005), as an explicit standard and policy objective for flood defence managers in Saxony (Socher et al., 2006), as a condition for obtaining state funding for local flood defence projects in North Rhine-Westphalia (Krieger, 2012) or as a minimal protection standard required by administrative court decisions in Bavaria (LAWA, 2004).

England's state, in contrast, defines targets for the economic and risk management performance of state activities but the targets do not commit the state to providing a particular level of protection to the population. DEFRA introduced the so-called Outcome Measures in 2007 (DEFRA, 2007) – replacing a system strongly shaped by project-level cost-benefit assessments (Scrase and Sheate, 2005) – along with general funding priorities (e.g. flood warning over flood defences) and indicative flood defence standards (MAFF, 1993). Two of the Outcome Measures are relevant for flood defence management and the use of funding in flood management: Outcome Measure 1 (OM-1) establishes a minimal aggregate cost-benefit ratio of 5:1 for the public spending on flood management (whereby the benefit is calculated in avoided risk (probable damage)). Outcome Measure 2 (OM-2) stipulates that flood defence management is to aim at moving a certain number of properties (140,000 between 2008 and 2011) from relatively higher to lower risk categories (identified in DEFRA's National Flood Risk Assessment (NaFRA)).

The second distinction concerns the different conceptualisation of risk. Germany's HQ standard is a probabilistic standard that does not take into account potential economic damage. England's OMs are risk-based objectives, taking into account properties at risk and avoided probable damage.

The third distinction is about the centrality of risk in determining the allocation of financial resources for flood defence spending. Some of Germany's funding is not shaped by the HQ100 standard but allocation principles that do not consider hazard and risk calculations at all. Financial resources at state level are indeed geared towards achieving the probabilistic HQ-standards. However, the Federal government – in conjunction with states – provides funds that follow different allocational principles: The Joint Task Agriculture and Coastal Protection (GAK) uses the '*Koenigsberger Schluessel*' that allocates funding in accordance to population numbers. Financial aid to the states affected by flooding in 1997 (Brandenburg) and 2002 (Saxony; Saxony-Anhalt) was mobilised on an ad-hoc politically negotiated basis immediately after the disasters. In England, risk-based OMs determine the allocation of almost all funding available for England's flood management. This is because funding has – following the critique of the previous, mixed local-central funding in the aftermath of the Easter floods in 1998 (SCA, 1998) – been centralised and subject to central government control.

Land-use regulation

How does risk-based land-use regulation look like in Germany and England? Three differences can be observed. The first difference lies in the rigidity and spatial coverage of risk-based regulation of land-use.

In Germany, the HQ100 reference standard serves, as stipulated in the Federal Flood Protection Act from 2005, to identify the tightly regulated 'inundation areas' (*Ueberschwemmungsgebiete*) (Bundesregierung, 2005b, Berendes, 2005). As a result, planners and developers who want to economically utilise an area that is likely to be flooded more frequently than once every 100 years face a *de facto* ban on development plans. Beyond

these areas, Federal legislation introduced the 'flood-prone areas' (*ueberschwemmungsgefaehrdete Gebiete*) but defined these areas vaguely as areas in which inundation results in adverse effects on public well-being (*Wohl der Allgemeinheit*) and that are not 'inundation areas'.

England's regulations cover the area that would be inundated in events with a return period of once every 1,000 years. The covered area is split up into three flood zones (as displayed on the EA's Flood Map as natural floodplain >HQ20; high risk: >HQ100; moderate risk: <HQ100>HQ1,000). The regulation of this large area is flexible and differentiated: Local planners are – following the so-called 'Sequential Approach' – advised to steer the development to the low-risk flood zone (DCLG, 2006b, DETR, 2001). In addition to this general rule, however, planner may take into account the vulnerability of a development (via 'Vulnerability Classification') and its wider sustainability benefits (via 'Exception Test'). In other words, nurseries, for instance, can be treated differently from retailers (due to their varying vulnerability levels) and commercial areas from residential areas (due to differentials in economic benefits).

The second difference concerns the design of the risk assessment instrument used in land-use regulation, the flood map. Germany's flood maps display the protective effects of flood defences. In England, the EA's Flood Map displays the extent of inundation while disregarding the effects of flood defences. This difference points to a different treatment of the uncertainty of the protection through flood defences.

The third difference concerns the effectiveness of risk-based regulation. In Germany, the binary pattern of regulation (tightly regulated 'inundation areas' versus vaguely regulated 'flood-prone' areas) is echoed in the implementation of the regulations. The legal concept of 'inundation areas' in the Federal Flood Protection Act from 2005 is an immediately effective regulation that is directly binding for the local planning officers. An interviewed flood manager notes notes that "the only that we can imagine and see in practice [in terms of development in HQ100 areas] are shipyards and ports" while a local planner describes his position as being "cornered" by the regulations. For 'flood-prone areas', the states are required to fill the vague concept with life. The states in turn – if they adopted 'flood-prone areas' at all – regulated the areas very generically (e.g. NRW's generic regulation to reduce adverse consequences to the public good or Saxony-Anhalt's requirement to make a note in planning decisions that a property is in a flood-prone area) (Krieger, 2012).

In England, lack of compliance of local planning authorities (LPAs) with national planning policies has been perceived as a major problem for achieving risk reduction goals. This has been argued to reflect the non-binding character of national planning policies, as well as conflicting local priorities (Howe and White, 2002, Howe and White, 2004). However, compliance has improved substantially over recent years, from 40% of planning proposals being approved *against* the advice by the EA based on the EA's risk assessments in 2001/2002 to only 10% in 2007/2008 (EA, 2004, EA, 2008).

2.2 Institutional variables and their effects on risk-based flood management

Three sets of institutional variables shape the varied use of risk in flood management in Germany and England: political culture and norms; style of public administration; and state structure. As the following sections show, these variables offer explanations for the cross-country differences in the risk-based flood management discussed in section 2.1.

Normative and cultural foundations of the state and risk-based flood management

The first variable that affects the use of risk in governance is normative and cultural. It concerns the perceptions of statehood, its objectives and responsibilities, as they are held by

key actors within the flood management approaches and manifest themselves in policy initiatives and normative foundations of polities.

The normative and cultural foundations of Germany's statehood define it as a 'protective state'. The German constitution, the Basic Law, offers an instructive starting point to learn about these foundations of Germany's polity and flood management. This is because, as Dyson notes, Germany's constitutional norms are not only seen "as a general framework establishing a minimum consensus about certain principles" but "as a political programme containing particular substantive goals" (1980, 213). This 'political programme' ascribes a significant responsibility to the state for the well-being and protection of the population, whether through the core norm concerning the protection of human dignity (article 1) and physical integrity (article 2) or the welfare state article (article 28).

How do these normative and cultural foundations shape Germany's risk-based flood management in the two countries? Perceptions of a 'protective state' are reflected in many ways in the flood management: Interviewed flood managers speak about their role in the *Daseinsvorsorge* (protection from mishaps) of individuals; policy guidance defines effective flood management as 'highest-order' public good of 'overriding significance' (Berendes, 2005, 202) linked to the well-being of the population in general (*Wohl der Allgemeinheit*) (LAWA, 1995, 2) while administrative court cases stressing the state's duty to provide protection to residential and working areas suggest a concrete relevance of constitutional norms in the flood management context (LAWA, 2004). The flipside of the wide-ranging state responsibility are perceptions – in the words of an interviewed local flood manager – that "individual responsibility is only for residual risk, not for all the risk". Another indicator for public expectations and policy-makers' perceptions of the state's responsibility for the population's well-being is the extensive financing of disaster recovery in the aftermath of floods at the Odra 1997 (0.25 billion Euro) and Elbe 2002 (6.5 billion Euro) (Schwarze and Wagner, 2006, Krieger, 2012).

These manifestations of the 'protective state' have concrete implications as to how risk is used in Germany's flood management, in particular in the form of the widely adopted HQ100 standard. The HQ100 standard implies that Germany's flood managers aspire to provide a particular level of protection to (almost) all individuals (through HQ100 and above flood defences but also by banning land use in HQ100 areas). In other words, it essentially aims to protect individuals against all floods events that occur in their lifetime (with the Germans average life expectancy being below 100 years). HQ100 therefore provides an ambitious standard while at the same time defining the boundary for the responsibilities of the 'protective state' (i.e. less frequent events that occur once every 100 years). Against this background of the 'protective state', interviews with German flood managers also showed that the risk-based differentiation of protection of individuals (e.g. defence investments are allocated to where probable damage is expected highest) is viewed as politically and legally problematic.

In short, the normative foundations of Germany's state promote a safety orientation in flood management that uses the *hazard*-based, probabilistic standard of HQ100 to define an ambitious realm of responsibility for Germany's protective state within flood management. Since the 'protective state' draws on abstract constitutional norms, differential treatment of population groups with different *risk* levels emerges as politically and legally problematic.

England's normative and cultural foundations are in the absence of a written constitution more difficult to identify and more amenable to change. The influential account of Britain's regulatory state by Moran stresses that since the 1980s Britain's state has pursued the general objective of "raising [its] competitiveness against global competition" (2003, 155). This is

reflected in the Thatcher government's neoliberal agenda of deregulation, privatisation and liberalisation initiatives (Peck, 2001), as well as in the early and comprehensive adoption of New Public Management (Hood, 1991). In addition to this economic orientation, Moran observes an increasing emphasis on "standardisation, central control and synoptic legibility to the centre" (ibid:7) in response to the previously prevalent informal arrangements of Britain's failed 'club government' from the 1970s and earlier. Power's account of the 'audit society' (Power, 1997), Hood and colleagues' 'regulation inside government' (Hood et al., 1998) Bevan and Hood's observation of a target culture in public policy (Bevan and Hood, 2006) reinforce Moran's account of increasing accountability and transparency pressures in England.

The orientation towards economic efficiency as an objective of England's state is widely reflected in the flood management. DEFRA, for instance, signed a Value-for-Money Delivery Agreement and commits to "deliver savings (...) through the use of a more risk-based approach" (DEFRA, 2009) to flood management spending, among other economic efficiency goals (such as 'return on public investments' (EA, 2003, 12) and 'value for money' in flood management spending (DEFRA, 2005, 15). An additional aspect is the emphasis by key policy-makers on individual responsibility for flood risk and the promotion of private insurance markets for flood risk (Arnell et al., 1984, ABI and Government, 2008). Risk instruments have been instrumental in pursuing the economic efficiency objective within England's flood management: Centrally devised calculations of probable damage (via the National Flood Risk Assessment-NaFRA) are instrumental to pursuing Outcome Measures 1 and 2, maximising the risk reduction per pound spent on defences and accepting differential treatment of areas. In planning, assessments of vulnerability and socio-economic benefits allow planners to regulate land use in a more targeted manner that takes into account the economic consequences of flooding and land-use regulations.

The importance of accountability pressures is also reflected in perceptions of flood managers. One example is DEFRA's OM-2 (shifting a certain number of properties into a lower risk category) that aims at managing risk rather than promising a certain level of protection. Performance against OM-2 therefore is easily measurable (number of properties) while at the same time potential blame is avoided through the absence of any safety promise. Another case in point is the endorsement of the EA's standardised, science-based risk assessments by the interviewed land-use planners. Such risk assessment offer transparent and convincing justification for rejecting development proposals in the face of interest group pressure by developers (Porter and Demeritt, forthcoming).

In short, the normative and cultural foundations of England's polity promote an economic and defensive rationale for the use of risk in flood management. The economic rationale implies risk-based governance in the form of the consideration of economic consequences of floods (probable damage) and flood management (planning restrictions) in decisions concerning the allocation of financial and regulatory resources. To deal with accountability pressures, England's flood managers highlight the uncertainty aspect in risk-based governance (DEFRA's OM-2) while land-use planners use the 'objectivity' of risk assessment to mitigate accountability pressures.

Procedural characteristics of the state and risk-based flood management

The second variable that affects the use of risk in governance is procedural and concerns the style of public administration. It is about whether there is a rulebook upon which administrative actions are based, how formalised and binding this rulebook is, and whether administrators are being held accountable for what is written down in the rulebook.

Germany's rulebook consists of binding public laws; its style of public administration is 'juridified'. Any administrative intervention must be based on formal law and is subject to judicial review through a specialised court system (*Verwaltungsgerichtsbarkeit*). The importance of a legalistic logic also manifests itself in the legal training of public civil servants – along with subject expertise (Hood and Lodge, 2004). Knill (1999) argues that the comprehensive body of administrative law provides a 'rigid backbone' of constraints for public authorities, with binding legislation prescribing many aspects of the decisions and measures by public authorities.

How do these procedural principles shape Germany's risk-based flood management? Risk-based approaches to flood management conflict with aspects of the legalistic foundations of the public administration (cf. Rothstein et al., 2010). Risk calculations and risk-based management measures are associated with uncertainty. They (are to) serve as a basis for state interventions into property rights (land-use regulations) and for describing how the state ensures the well-being of the population (flood defences). Revealing uncertainty in risk calculations may lead to judicial challenges because the state's interventions into property rights may be judged to be disproportionately restrictive (e.g. if flood maps and subsequent regulations do not reflect the protective effects of flood defences) or fail to provide the required levels of protection.

Germany's flood and land-use managers recognise the importance and threat of judicial review. One interviewed flood managers suggests that formally-codified legal concepts such as inundation areas need to be "black and white", and complains about the "simplistic binary conceptualisations [between safe and unsafe areas]" required by the legal specialists (*Juristen*) in administrations and court systems. A local planner points out that the regulation of 'flood-prone areas' (areas behind defences) lags behind because of the threat of legal challenges to regulations of protected areas (perceived as infringements of property rights). One consequence of the need for legal defensibility is the wide adoption and almost exclusive use of the HQ100 standard in Germany's land-use regulation and flood defence management. The HQ100 standard is historically and scientifically well-established, and is therefore legally defensible as a 'widely accepted technical norm' (*allgemein anerkannte Regel der Technik*). Regulations using the value of HQ100 are also embedded in the physical reality. In the Federal Flood Protection Act from 2005, for instance, the concept of 'inundation areas' is also defined as the areas between river channels and flood defences – this 'physical' definition is complementary to the hazard-based HQ100 standard.

In short, the actions of the flood and land-use managers need to be compatible with the legalistic logic underlying public administrative actions in Germany. Risk-based governance is a challenge for this logic because it is problematic to undertake interventions into private property rights and assuming responsibility for the population's safety on the basis of *uncertain* concepts.

England's style of administration can best be described as 'managerial'. There is neither a formal constitution nor a specialised court system examining the legality and constitutionality of administrative operations. Disagreements are generally expected to be resolved by negotiations or through an appeal to the minister (Halffman, 2005). In general, public law is not perceived as the "great interpreter of politics" (Hancher and Moran, 1989, 156). At the same time, New Public Management (NPM) has become increasingly important in England's public administration since the 1980. NPM is normally associated with greater managerial scope and 'performance accountability' (Light, 1993, Hood, 1991).

England's flood managers therefore do not face the judicial constraints that make it hard for German flood managers to acknowledge and integrate uncertainty associated with risk into

governance. To illustrate this, the domain of land-use management is instructive. Planning decisions at local level require – as a first level of review – the approval of the specialist EA as statutory consultee but continue to disregard one out of ten recommendations by the EA (EA, 2008). Planners are also subject to an appeals process that involves the generalist inspectors from the Planning Inspectorate (PINS). However, the 'inspection' resembles an individualistic balancing-of-interests process. One interviewed inspector notes: "what each inspector does, with his own experiences in mind, is to decide which policies and which degree of compliance is really important". Where disagreements persist, a planning decision can be presented to the Secretary of State at the Department of Communities and Local Government. Only when all these administrative steps are exhausted, a case can be brought to the High Courts of Justice. It is important to note that the multi-stage non-judicial review of administrative actions in England's land-use regulations is undertaken against the already flexible, largely non-binding national planning policies. In this review context, the use of 'objective' risk assessments adds weight to the arguments of the Environment Agency vis-a-vis planners and developers. Moreover, the adoption of NPM and a 'target culture' (Bevan and Hood, 2006) suggests different review pressures, namely against performance. This performance is, as noted, often measured in avoided risk, economic savings and benefits.

In short, the procedural aspects underpinning the public management of flooding do not conflict with the adoption of risk-based governance in England's flood management. On the contrary, since the review process is largely administrative, prevailing administrative doctrines (NPM; Hampton review's endorsement of risk-based regulation) provide a conducive environment for risk-based flood management in England.

Structural characteristics of the state and risk-based flood management

The third variable that affects the use of risk in governance is structural. It concerns fragmentation and coherence in the relation between central government and lower levels of government, as well as in the organisation of the executive and administration.

Germany's polity offers a mixed picture: On the one hand, policy-making is fragmented as a result of the Federal structure that creates autonomous but mutually dependent governments at Federal and state (Lander) level (Grimm, 2003, Schmidt, 2008). In flood management, for instance, both governments at the Federal level and in the 16 states (Lander) have policy and operational responsibilities (via Federal and state-level Water Acts, as well as Federal, transregional and Lander river and water management authorities). However, many of these responsibilities are shared (e.g. through Joint Task Agricultural Structure and Coastal Defence (GAK) or the bicameral legislative procedures and 'framework' nature of Federal Acts), implying the need for substantial co-ordination between government levels with overlapping policy-making responsibilities. On the other hand, once legislation is in place, the implementation can be expected to be relatively coherent: The public administration is organised hierarchically and operates on the basis of a dense web of public law. In addition, primacy in terms of responsibility for flood management is attributed to the specialist government departments (environment/water ministries/authorities) thanks to the principle of departmental autonomy at cabinet level and the prerogative of specialist over generalist administration (Lees, 2007, ELLA, 2006).

How do these factors influence the form of Germany's risk-based flood management? Germany's system of mutually dependent multi-level governments impedes the adoption of a centralised risk-based allocation of flood management resources. Instead, the horizontal co-ordination needs and veto powers between states and Federal level promote a political logic for resource allocation. Specifically, this implies, on the one hand, the use of HQ100 and other HQ-standards. Such a standard implies formally equal duties of flood management

across Germany, as well as uniform regulations of economic activities in at-risk areas. This is important to ensure that transregional river catchments are not managed inconsistently and that states and populations receive formally equal treatment. On the other hand, the allocation of financial resources for flood management of Federal and state-level governments uses the '*Koenigsberger Schluessel'* for the allocation of the Joint Task GAK funds or is driven by ad-hoc negotiations between government on Federal and state levels. Allocations therefore reflect political power positions in negotiations rather than levels of risk.

Moreover, the intertwined responsibility in Germany's fragmented polity also implies that there is less need for risk-based governance as a defensive strategy to deflect blame. In complex polities like Germany's (Schmidt, 2005), responsibilities are shared and accountability opaque. This reduces blame attribution to specific state actors and attenuates public scrutiny.

The HQ100 standard is interesting for another reason: HQ100 does not take into economic damage (integral to the concept of risk) but only the probability of an event. This focus on the hazard rather than the risk of flooding can be connected to the prevalence of water specialists in Germany's flood management – in line with the emphasis on *Fachwissen* (subject-expertise) in Germany's public administration (Hood and Lodge, 2004). The administrators with specialist knowledge can be expected to hold expertise in water quantities and their management rather than calculating socio-economic damage (cf. Jones and Hood, 1996).

In short, structural characteristics of Germany's institutional set-up therefore introduce barriers to a centralised risk-based allocation, weaken the accountability driver of risk-based governance, and promote a hazard-based, uniform standard-setting rather than a discriminatory regulatory treatment on the basis of different levels of risk.

England's polity displays different features: In England, the institutional settings relevant for flood management are fragmented both in policy-making and implementation. The Environment Ministry (DEFRA) (with policy-making responsibility) and the central government Environment Agency (EA) (with operational responsibility) are England's key specialist flood/water management actors. However, fragmentation in England's polity implies a lack of specialist control over flood management: DEFRA's lead role is restricted by the central role of the Finance Ministry (HM Treasury) in the UK Cabinet (based on the HMT's control of access to public resources and its setting of the broad principles of public sector operations) (Campbell and Wilson, 1995, Chapman, 1997, Lee and Woodward, 2002). DEFRA and the EA also have limited control over land-use control decisions taken by autonomous, directly elected local authorities and their planning officer (Jones, 1990, Pottier et al., 2005). Moreover, another important aspect of fragmentation is that the EA is a non-departmental public body that is – within legal and contractual boundaries – autonomous from DEFRA.

Fragmentation plays out in a different manner in England, reflecting distinct and separate rather than shared and overlapping responsibilities. Specifically, the fragmentation compels flood specialist actors to adjust their measures and strategies to the internal logic and interests of other involved, autonomous actors within the flood management. At the same time, the clear separation of responsibilities has another effect: the Environment Agency – as autonomous agency with key and increasing[6] responsibilities for flood management and its

[6] Following the flood events in 1998 and 2000 the EA saw its remit expanded to include critical ordinary watercourses (previously managed by local authorities or internal drainage boards), as well as being given a stronger general supervisory role over all types of flooding (DEFRA 2005).

subsequent high public profile (RRAC, 2009) – is exposed to substantial blame attribution, resulting in a need for blame deflection (cf. Hood, 2002).

One set of interactions between specialist and non-specialist government actors concerns the role of HM Treasury (HMT). Concretely, DEFRA uses risk calculations to make an economic case for flood management spending vis-a-vis the Treasury. HMT requires government departments to prove the relative value-for-money of their use of public money in order to claim a share of the budget, and more generally supports a risk-based approach to regulation (Hampton, 2005). The economic efficiency orientation therefore is also promoted as a result of the structure of England's polity – in addition to the previously discussed norms and culture underlying England's flood management approach. This orientation is, as noted, reflected in the risk-based Outcome Measures, as well as DEFRA and other actor's endorsement of 'value for money' and other economic efficiency concepts.

Another set of interactions involves the non-specialist local planning authorities. Specifically, the EA seeks to persuade autonomous local planning authorities (LPAs) to take into consideration flood risk. In contrast to the specialist EA, generalist local planners pursue a wider range of objectives, including local economic development in areas at flood risk (NAO, 2001, Parker, 1995). While some of the EA's 'persuasion' of LPAs relies on formal restrictions (e.g. ministerial call-ins of planning decisions), the central instruments of the EA work indirectly, namely by introducing a targeted regulatory approach based on risk assessment. Specifically, the EA provides 'objective' risk maps to shape the planning decisions at local level on the basis of the social authority conveyed by expertise and science (Miller and Rose, 1990). At the same time, the regulatory core, through the Vulnerability Classification (potentially allowing sufficiently resilient development to be approved) and Exception Test (potentially allowing socio-economically beneficial developments to obtain permission), is more flexible to accommodate non-specialist interests, such as local economic development.

One important reason for the EA to take an interest in informing and shaping planning decisions is blame avoidance. The EA attracted substantial criticisms in the aftermath of the Easter 1998 floods, culminating in the establishment of an independent enquiry (Bye and Horner, 1998) and increasing the EA's perception of – in the words of an interviewed EA official – being in the "frontline" of post-disaster blame attribution. One element in the EA's blame deflection strategy is to provide local planners with assessments and planning advice that inform them about the risks, thereby responsibilising the planners to take into account flood risk. Another element is actually the design of flood maps: By displaying the extent of inundation *disregarding the effects* of flood defences, the EA's Flood Map "emphasises that risk is a continuum and that there is no such thing as a safe place", as an EA official interviewed remarked. This in turn implies that if a property behind defences has been flooded, it is difficult to attribute blame to the EA since it had flagged the risk on the map.

In short, England's case demonstrates how the defensive and economic roles of risk in flood management can be linked to certain structural characteristics of a polity. Adopting risk-based approaches facilitates co-ordination with non-specialist actors necessary due to the structural fragmentation between central and local levels in planning and the historically evolved concentration of power in the hands of HMT. Both types of non-specialist actors, HMT and LPAs, pursue additional, often economic, objectives that flood management. Moreover, the semi-autonomous EA in particular potentially attracts blame in the case of governance failure and therefore use the blame deflecting capacities of risk-based approaches (uncertainty; 'objectivity').

5 CONCLUSIONS

This paper set out to examine arguments about the universal rise of risk-based governance. Using the case of flood management of Germany and England in the 1990s and 2000s, it showed that risk in governance can be conceptualised and used in different ways and to varying degrees, and provides an institutionalist explanation for this variance.

In terms of cross-country variance in risk-based flood management, Germany's flood management relies on a partial conceptualisation of risk by focusing on the probabilistic component of risk; uses this partial concept of risk to pursue a strategy of providing equal, minimal safety to the population; and sees risk as an allocation principle being marginalised by a political (negotiation) logic in some areas of flood management. England's flood management strongly relies on the comprehensive concept of risk in governance; makes use of risk-based governance to pursue economic efficiency and blame deflection goals; and assigns a central role to risk across public flood management domains.

This paper argued that institutionalist variables, in particular sets of norms, procedures and structures, can explain the choices of flood managers in Germany and England. Germany's Federal structure, law-based administrative procedures and the state's assumption of wide-ranging responsibility for well-being of the population are difficult to reconcile with conceptualisations of risk that include uncertainty and probable damage. Moreover, institutional characteristics of Germany's polity mitigate the two drivers of risk-based governance. Specifically, the opaque and intertwined responsibility within Germany's Federal structure mitigates accountability and scrutiny pressures while the normative 'safety orientation' and need for political co-ordination between different government levels sideline an economic efficiency orientation. In contrast, England's competitiveness and transparency culture, the 'managerial' public administration, as well as structural characteristics that elevate the economics-oriented Treasury within the government, expose the Environment Agency to blame attribution and weaken control over local land-use decision underpin and reinforce the drivers of risk-based governance.

The findings of this research therefore raise a number of questions about the cross-national diffusion of policy concepts. It highlights that even though risk may be endorsed in different countries, actors may differ in how they conceptualise the term. The use of risk is also not necessarily connected to the pursuit of a greater economic efficiency or the purpose of blame deflection. Instead, it may formally establish the state as actor that commits to providing safety – within clearly (risk-based) defined boundaries. Finally, assumed dynamics, such as that of risk colonisation (Rothstein et al, 2006a) may face insurmountable institutional barriers that provide prerogative to alternative logics of allocation.

To rigorously establish how and in what combinations institutions affect risk-based governance, it is important to embark on further cross-country and cross-risk issue research. Countries such as France and the Netherlands offer different combinations and types of institutions than Germany and England; other risk sectors (e.g. financial or health risk) may have other sector-specific dynamics and institutional settings. Finally, while this paper focused on the state's risk governance, private risk management, such as commercial insurance, may interact with the public arrangements (Huber, 2004) and/or offer complementary insights into the role of risk in governance and its determinants.

BIBLIOGRAPHY

ABI. (2001) Flooding: A partnership approach to protecting people. In: ABI (ed). London.

ABI. (2004b) Flood Resilient Homes- What homeowners can do to reduce flood damage? In: ABI (ed). London.

ABI & Government. (2008) Statement of flooding and insurance for England. London: Association of British Insurers & HM Government.

Arnell N, Clark M & Gurnell A. (1984) Flood insurance and extreme events: the role of crisis in prompting changes in British institutional response to flood hazard. *Applied Geography* 4: 167-181.

Barredo J. (2007) Major flood disasters in Europe: 1950-2005. *Natural Hazards* 42: 125-148.

Berendes K. (2005) Das Hochwasserschutzgesetz des Bundes. *Zeitschrift fur Wasserrecht* 44/45: 197-214.

Bevan G & Hood C. (2006) Health Policy: Have targets improved performance in the English NHS? *BMJ* 332: 419-422.

Black J. (2005) The emergence of risk-based regulation and the new public risk management in the UK. *Public Law*.

Bundesregierung. (2005a) Bericht der Bundesregierung über die nach der Flusskonferenz vom 15. September 2002 eingeleiteten Massnahmen zur Verbesserung des vorbeugenden Hochwasserschutzes. In: Bundesregierung (ed) *Bericht.*

Bundesregierung. (2005b) Gesetz zur Verbesserung des vorbeugenden Hochwasserschutzes. Bundesgesetzblatt, 1224-1228.

Bye P & Horner M. (1998) Easter Floods 1998 - Final Assessment by the Independent Review Team.

Campbell C & Wilson G. (1995) *The end of Whitehall: death of a paradigm*, Oxford: Blackwell.

Castree N. (2008a) Neoliberalising nature: processes, effects, and evaluations. *Environment and Planning A* 40.

Castree N. (2008b) Neoliberalising nature: the logics of deregulation and reregulation. *Environment and Planning A* 40: 131-152.

Chapman R. (1997) *The Treasury in public policy-making*, London: Routledge.

DCLG. (2006b) Planning Policy Statement 25: Development and Flood Risk. In: DCLG (ed).

DEFRA. (2005) Making space for water. London: DEFRA.

DEFRA. (2007) *Outcome Measures*. Available at: http://www.defra.gov.uk/environment/flooding/policy/strategy/outcomemeasures.htm.

DEFRA. (2009) Defra Value for Money Delivery Agreement Comprehensive Spending Review 2007. London: DEFRA.

DETR. (2001) Planning Policy Guidance note 25. London: HM Government.

Dyson K. (1980) *The State Tradition in Western Europe*, Oxford: Martin Robertson.

EA. (2003) Strategy for flood risk management (2003/4-2007/8). In: Murphy D (ed). London.

EA. (2004) High-Level Target 5: Development and Flood Risk. Bristol: Environment Agency

DEFRA

DETR.

EA. (2008) High-Level Target 5: Development and Flood Risk Bristol: Environment Agency.

EA. (2009) *Flood Map - your questions answered*. Available at: http://www.environment-agency.gov.uk/homeandleisure/floods/31662.aspx.

EC. (2001) Good Governance - A White Paper. Brussels: European Commission.

EC. (2002) Science and Society Action Plan. Brussels: European Commission.

ELLA. (2006) Hochwasserschutz- und Raumplanungsrecht im deutschen Einzugsgebiet der Elbe. Berlin: BMVBS.

Ericson R, Doyle A & Barry D. (2003) *Insurance as governance,* Toronto: University of Toronto Press.
Giddens A. (1991) *Modernity and self-identity. Self and society in the late modern age,* Cambridge: Polity Press.
Grimm D. (2003) Lässt sich die Verhandlungsdemokratie konstitutionalisieren? In: Offe C (ed) *Demokratisierung der Demokratie. Diagnosen und Reformvorschläge.* . Frankfurt: Campus.
Halffman W. (2005) Science-policy boundaries: national styles? . *Science and Public Policy* 32: 457-467.
Hampton P. (2005) Reducing administrative burdens: effective inspection and enforcement. London: HM Treasury.
Hancher L & Moran M. (1989) Organizing Regulatory Space. In: Baldwin R, Scott C & Hood C (eds) *A Reader on Regulation.* Oxford: OUP, 148-172.
Hood C. (1991) A Public Management for All Seasons. *Public Administration* 69: 3-19.
Hood C. (2002) The Risk Game and the Blame Game. *Government and Opposition* 37: 15-37.
Hood C, James O, Jones G, Scott C & Travers T. (1998) Regulation Inside Government: Where New Public Management Meets the Audit Explosion. *Public Money & Management*: 61-68.
Hood C & Lodge M. (2004) Competency, Bureaucracy, and Public Management Reform: A Comparative Analysis. *Governance* 17: 313-333.
Hood C & Scott C. (2000) Regulating Government in a 'Managerial' Age: Towards a Cross-National Perspective. *LSE CARR Working Papers*.
Hood C, Scott C, James O, Jones G & Travers T. (1999) *Regulation inside government,* Oxford: OUP.
Howe J & White I. (2002) Flooding and the Role of Planning in England and Wales: A Critical Review. *Journal of Environmental Planning and Management* 45: 735-745.
Howe J & White I. (2004) Like a Fish Out of Water: The Relationship between Planning and Flood Risk Assessment in the UK. *Planning Practice and Research* 19: 415-425.
Huber M. (2004) Reforming the UK Flood Insurance Regime. The Breakdown of a Gentlemen's Agreement. *LSE CARR Working Papers*.
Hutter B. (2005) The Attractions of Risk-Based Regulation: accounting for the emergence of risk ideas in regulation. *LSE CARR Working Papers*.
Jasanoff S. (1986) *Risk Management and Political Culture,* New York: Russell Sage Foundation.
Jasanoff S. (2005) *Designs of Nature - Science and Democracy in Europe and the United States,* Oxford: Princeton University Press.
Johnson CL, Tunstall SM & Penning-Rowsell EC. (2005) Floods as Catalysts for Policy Change: Historical Lessons from England and Wales. *Water Resources Development* 21: 561-575.
Jones D & Hood C. (1996) Introduction. In: Hood C & Jones D (eds) *Accident and Design - Contemporary debates in risk management.* London: Routledge, 1-9.
Jones G. (1990) Local government in Great Britain. *Local Government and Urban Affairs in International Perspective.* Baden-Baden: Nomos, 167-210.
Knill C. (1999) Explaining cross-national variance in administrative reform: Autonomous versus instrumental bureaucracies. *Journal of Public Policy* 19: 113-139.
Knill C & Lenschow A. (1998) Coping with Europe: the impact of British and German administrations on the implementation of EU environment policy. *Journal of European Public Policy* 5: 595-614.
Krasner S. (1983) *International Regimes,* Ithaca, NY: Cornell University Press.

Krieger K. (2012) Putting varieties of risk-based governance into institutional context: The case of flood management regimes in Germany and England in the 1990s and 2000s. *Department of Geography.* London: King's College
LAWA. (1995) Guidelines for Forward-Looking Flood Protection. Stuttgart: Länderarbeitsgemeinschaft Wasser - LAWA.
LAWA. (2004) Instrumente und Handlungsempfehlungen zur Umsetzung der Leitlinien für einen zukunftsweisenden Hochwasserschutz. Düsseldorf: Länderarbeitsgemeinschaft Wasser - LAWA.
Lee S & Woodward R. (2002) Implementing the Third Way: The Delivery of Public Services under the Blair Government. *Public Money and Management* 22: 49-56.
Lees C. (2007) Environmental Policy in the United Kingdom and Germany. *German politics* 16: 164-183.
Light P. (1993) *Monitoring government: Inspectors General and the Search for Accountability,* Washington, DC: Brookings.
Lodge M, Wegrich K & McElroy G. (2008) Gammelfleisch everywhere? Public debate, variety of worldviews and regulatory change. *LSE CARR Discussion Papers*.
Luhmann N. (1993) *Risk: A Sociological Theory,* Berlin: de Gruyter.
MAFF. (1993) Strategy for Flood and Coastal Defence in England and Wales. London: MAFF.
March J & Olsen J. (1984) The New Intitutionalism: Organizational Factors in Political Life. *American Political Science Review* 78: 734-749.
Miller P & Rose N. (1990) Governing economic life. *Economy and Society* 19: 1-31.
Mitchell J. (2003) European River Floods in a Changing World. *Risk Analysis* 23.
Moran M. (2003) *The British Regulatory State,* Oxford: OUP.
NAO. (2001) Inland Flood Defence. London: NAO.
North D. (1990) *Institutions, institutional change and economic performance,* Cambridge: CUP.
O'Malley P. (1999) Governmentality and the risk society. *Economy and Society* 28: 138-148.
O'Malley P. (2003) Governable catastrophes: a comment on Bougen. *Economy and Society* 32: 275-279.
O'Malley P. (2004) *Risk, uncertainty and government,* London: Glasshouse Press.
OECD. (2009) Innovation in country risk management. *OECD Studies in Risk Management.* Paris: OECD, SwissRe & Oliver Wyman.
Parker D. (1995) Floodplain development policy in England and Wales. *Applied Geography* 15: 341-363.
Peck J. (2001) Neoliberalizing states: think policies/hard outcomes. *Progress in Human Geography* 25: 445-455.
Peck J & Tickell A. (2002) Neoliberalizing Space. *Antipode*: 381-404.
Pierson P. (2000) Increasing returns, path dependence, and the study of politics. *American Political Science Review* 94: 251-267.
Porter J & Demeritt D. (forthcoming) Flood risk management, mapping and planning: the institutional politics of decision-support in England. *Environment and Planning A.*
Porter T. (1995) *Trust in Numbers,* Princeton: Princeton University Press.
Pottier N, Penning-Rowsell EC, Tunstall SM & Hubert G. (2005) Land use and flood protection: contrasting approaches and outcomes in France and in England and Wales. *Applied Geography* 25: 1-17.
Power M. (1997) *The Audit Society,* Oxford: OUP.
Power M. (2004) *The Risk Management of Everything,* London: Demos.
Priest G. (1996) The Government, the Market, and the Problem of Catastrophic Risk. *Journal of Risk and Uncertainty* 12: 219-237.

Rothstein H, Borraz O & Huber M. (2010) From the 'Neurotic' to the 'Rationalising' State: Risk and the Limits of Governance In: Meyer C & De Franco C (eds) *Forecasting, Warning, and Transnational Risks: Is Prevention Possible?* Cambridge: CUP.

Rothstein H, Huber M & Gaskell G. (2006a) A theory of risk colonization: the spiralling regulatory logics of societal and institutional risk. *Economy and Society* 35: 91-112.

Rothstein H, Irving P, Walden T & Yearsley R. (2006b) The risks of risk-based regulation: Insights from the environmental policy domain. *Environment International* 32: 1056-1065.

RRAC. (2009) Rising Levels? Public awareness and understanding of risks from flooding. London: Risk and Regulatory Advisory Council.

SCA. (1998) Sixth Report Session 1997-1998, Flood and Coastal Defence. London: Select Committee Agriculture.

Schmidt MG. (2008) *Das politische System Deutschlands,* Bonn: Bundeszentrale fuer politische Bildung.

Schmidt V. (2005) The Role of Public Discourse in European Social Democratic Reform Projects. *European Integration Online* 9.

Schrader-Frechette K. (1991) *Risk and Rationality*, Berkeley: University of California Press.

Schwarze R & Wagner GG. (2006) The Political Economy of Natural Disaster Insurance: Lessons from the Failure of a Proposed Compulsory Insurance Scheme in Germany. *DIW Discussion Papers*.

Scrase JI & Sheate WR. (2005) Re-framing Flood Control in England and Wales. *Environmental Values* 14: 113-137.

Simon H. (1957) *Administrative Behaviour,* New York City: The Free Press.

Socher M, Dornack S & Defer E. (2006) Hochwasserschutzkonzepte in Sachsen - eine Einfuehrung. *Hydrologie und Wasserbewirtschaftung* 50: 303-308.

SwissRe. (2002) Floods are insurable! In: SwissRe (ed) *Focus Report.* Zurich.

UBA. (2006) Was sie über vorsorgenden Hochwasserschutz wissen sollten. In: Umweltbundesamt (ed) *Information.* Dessau.

Vogel D. (1983) Cooperative regulation: Environmental Protection in Great Britain. *Public Interest* 72: 88-106.

Vogel D. (1986) *National Styles of Regulation: Environmental Policy in Great Britain and the United States,* Ithaca: Cornell University Press.

Vogel D. (2003) Comparing Environmental Governance: Risk Regulation in the EU and the US. *Working Paper Series, Center for Responsible Business, UC Berkeley*.